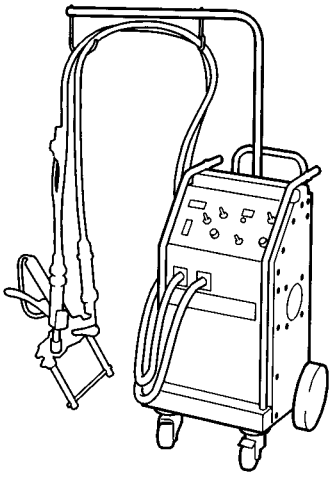
Welding Methods/Repair Tools

Spot Welding

Spot welding is also known as resistance spot welding, and it is the most suitable method of welding for vehicle. It has three main features: the welding can be performed instantaneously, it has a minimal effect on the source material, and it has a minimum affect on distortion to the absolute minimum. However, please remember to remove all paint and other impurities from the surface of the material you intend to weld for reliable results.

Welders:



Spot welder

Timer/Transformer

SPECIFICATIONS (Reference)

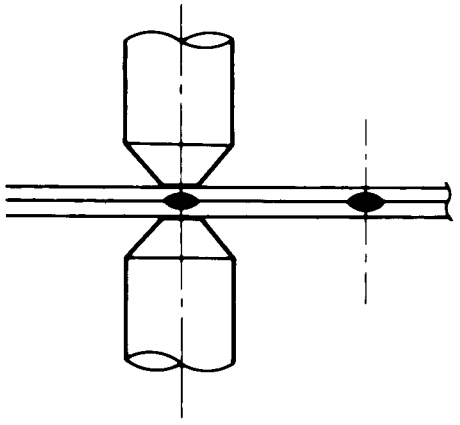
Input voltage	3-phase 200–415V 50/60Hz (designate the voltage when ordering)
Max input power	28KVA
Duty cycle capacity	12KVA
Duty cycle	6%
Secondary short-circuit current	16000A
Secondary short-circuit current standard	8000A
Control system Timer	Thyristor phase control 0.1-0.7 second
Remaining heat function	Max output 50%, with 0.3 second remaining heat function
Welding capacity (double sided)	6.0 mm (0.24 in)
Welding capacity (single sided)	1.6 mm (0.063 in)
Welding function through painted sturface	DCC circuit makes it possible to weld
Overheat warning equipment	Themostat guarantee safety from overheating
Power supply watching installation	Power supply and voltage indications by Analogue power meter
Cooling installation	Compulsion air-cooling by fan
Input power cable	8,5m, 3.5 square mm (28 ft, 0.14 square in)
Output power cable	3m, 150 square mm (10 ft, 5.91 square in)
Dimensions	345 (W)×340(D)×770(H) mm (13.6×13.4×30.3 in)
Weight	98kg (216 lbs)

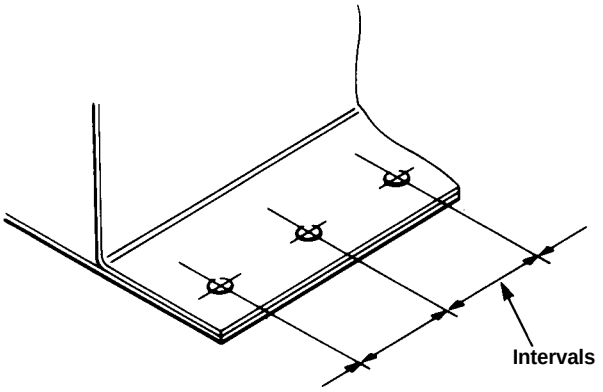
Welding Conditions:

When performing spot welding, make sure that you conform to the following conditions: use the correct current, conductivity time, welding pressure, holding time, and shutdown time recommended for the spot welder.

Please bear in mind the following points when welding:

- Plate thickness and minimum welding pitch



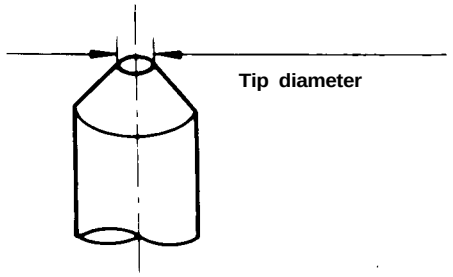


NOTE: If the welding intervals are too short, branching may occur, making it impossible to maintain the desired soldering state.

Unit: mm (in)

Plate thickness	0.6 (0.02)	0.9 (0.04)	1.2 (0.05)	1.6 (0.06)
Minimum intervals	11 (0.43)	16 (0.63)	20 (0.79)	24 (0.94)

Plate thickness and tip diameter



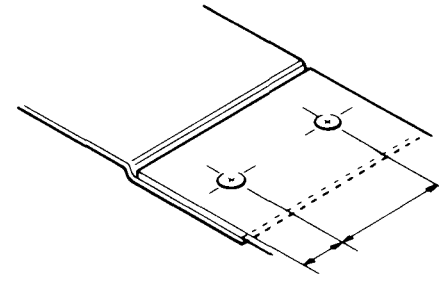
Unit: mm (in)

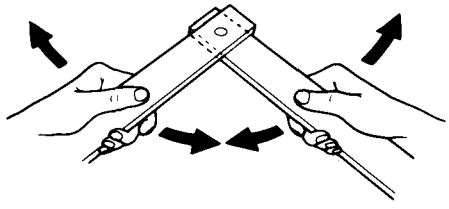
Plate thickness	0.8 (0.03)	0.9 (0.04)	1.2 (0.05)	1.6 (0.06)
Tip diameter	4.5 (0.12)	5.0 (0.2)	5.5 (0.22)	6.0 (0.24)

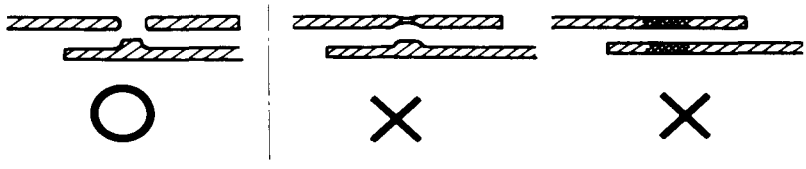
Welding Strength Test

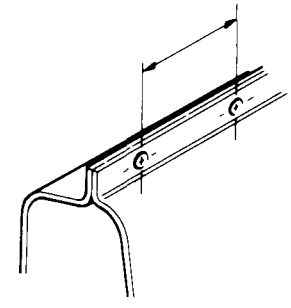
Even if you perform the welding according to the proper conditions, the strength of the welded sections may fluctuate clue to drops in the voltage and other factors. The quality of the welding cannot be evaluated unless the welded sections are destroyed. Provide yourself with a steel plate of the same thickness and conduct a destruction test.

- If holes appear in the steel plates, this means that the welding is of standard strength.

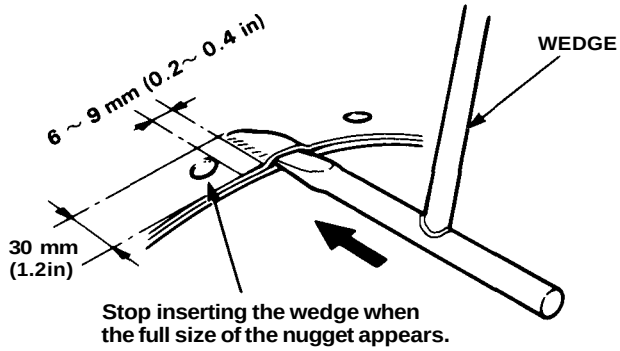




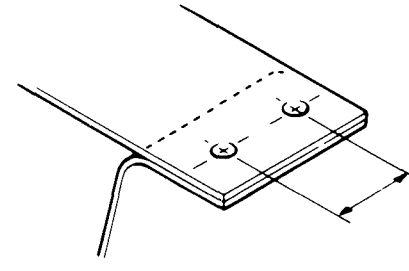




- Drive a wedge between two panels near the nugget. If the welded parts do not come apart and the diameter of the nugget is more than 3mm (0.1 in), the welding should be satisfactory.



Stop inserting the wedge when the full size of the nugget appears.



NOTE:

It is difficult to perform spot welding in the following circumstances:

- When it is not possible to remove any rust or paint attached to the welding surfaces.
- When the tip of the spot welder cannot be inserted into the welding section.
- When the welding surfaces can be seen from the outside and welding will impair the exterior appearance.

In all these cases, the gas welding method should be employed. Moreover, if it is not possible to perform spot welding because of space restrictions, plug welding using on the arc welding method may be performed instead. For plug welding, the sections to be welded must be close together.